Comments provided by Jerry Morse, Colorado School of Mines

The Plan is well organized, making technical sense and it shows considerable thought. My review resulted in a few general questions, and some specific comments, as follows

Questions:

1. What is the accuracy of sampling subsurface soil and ground water for VOCs?
2. How are VOCs held in soil? Dissolved in pore-water, entrapped in pore air space, adsorbed (on what?) or held by chemical attachment, or in some combination of the foregoing?
3. Are there acceptable levels for VOCs in soil and ground water?
4. In heavily VOC-contaminated areas, can their migration rates (from soil to ground water) be estimated from existing data collected under normal meterological conditions?

Specific Comments:

1. P. 2-6, Para 2.2, bottom. What minimum airflow is required to disturb existing equilibrium between free-phase, dissolved phase VOCs and soil gas? Were known partition coefficients used to estimate VOC distribution between air and solution phases?

2. P. 2-7,8. Table 2.1 From what depth were samples taken? Were multiple samples taken? Was a sufficient volume of ground water sampled to achieve statistically-valid data?

3. Solution mining of uranium from a shallow subsurface ore body lying in an acquifer may roughly parallel the SVE approach to VOC removal. Uranium recovery, in this circumstance, involves injecting a dilute aqueous bicarbonate solution into the ore body. Dissolved uranium is then pumped to the surface from depths of 50 to a few hundred feet. The pressure drop over the relatively short distances is significant enough to disturb the equibrium between radon in gas

and solution phases. It results in copious quantities of radon release at the surface, threatening the health of operating personnel.

To lessen any occupational hazard, federal agencies require uranium companies to use surface-mounted equipmentthat disburses radon into the atmosphere, rendering it harmless.

Can an analogy be drawn for anticipated surface releases of VOC from ground water?

4. P. 3-11, Para 3.2.7. Are VOC levels so large that they require GAC adsorption columns, rather than venting directly to air?

5. Sect. 6

- Does GAC column sizing match adsorption data for expected VOC entrappment?
- At expected concentrations, what percent VOC will be trapped on GAC? Percent estimated to escape?
- Are columns tested for VOC saturation, or replaced at fixed intervals?
- Alpha counting of small samples is accurate only if counted for an extended period. What accuracies do you expect for what counting times?

6. P. 7.1, Sect. 7. Stated criteria for success: 1 lb VOC collected in a 24 hr operating period. Why not give yourself some wiggle room by saying 24 hrs. of actual operation?

Comments provided by Kathryn Schnoor, Environmental Services Administrator, City of Broomfield

I. General Comments:

Many of Broomfield's comments on this pilot test plan were also comments made on the Proposed Final Subsurface Interim Measure/Interim Remedial Action Plan/Environmental Assessment and Decision Document-Operable Unit 2.

Since the migration of contaminants from OU2 is not an immediate threat to the public, Broomfield supports the idea of performing a subsurface pilot tests to gather information on treatment options that will aid in the design of the final remedy for OU2. We understand that there are great uncertainties associated with subsurface remediation and agree that the small-scale pilot study test plans are a sensible approach.

Broomfield's major concern with the pilot test plan, and the IM/IRA Plan in general, is the proposed use of the South Walnut Creek Treatment System for treatment of the ground water pumped from the subsurface and the condensate from the vapor extraction process. The South Walnut Creek Treatment System hasn't been in place long enough to establish its effectiveness in treating radionuclides. We have not seen any reports or even raw data to date that indicates that the radionuclide treatment is working. Any upset condition with that treatment facility would allow the contaminated ground water to flow directly into Walnut Creek. The City feels the treatment system at the terminal ponds on Walnut Creek is adequate to treat surface water with low level radionuclides as it was intended, but not adequately equipped to treat levels of radionuclides that may come from under OU2. There is potential for contamination to reach Great Western Reservoir or down stream users.

The IM/IRA Plan documented that the chemistry of the ground water in that area is uncertain. The pilot test plan does not address deviations from expected conditions due to incorrect assumptions with respect to site-specific hydrogeology and nature of contamination. With the uncertainties about the quality of the ground water and the relatively small volumes of ground water expected to be generated it would be prudent to use the Building 231 GAC Adsorption System and the Building 374 Low-Level Wastewater Treatment System. These established systems are well suited for removal of VOC's, radionuclides and metals

that may be present in the ground water and condensate. Broomfield strongly urges DOE to pursue this as the preferred treatment option.

The main objective of the pilot test plan is the vapor extraction process, and the plan does a good job of addressing that procedure, but details regarding ground water issues are all but ignored.

II. Specific Comments:

Page 1-7, paragraph 3 states that the expected recovery rate for ground water is 5 gpm based on pump test data. This is 5 times more than the 1 gpm discussed in the SUBSURFACE IM/IRA PLAN. Could it go higher?

Page 2-10, Section 2.3.1 states that the recovered ground water will be tested to determine whether it meets the influent requirements for the South Walnut Creek Water Treatment Facility (SWCWTF). What are the influent requirements? The Pilot Plan references Sec. 4.6 of the Subsurface IM/IRA Plan, but the influent requirements are not specifically listed there either.

Page 3-13, paragraph 2 states that "SWCWTF was selected as the preferred water treatment facility to process potentially contaminated ground water." Why? It also states that use of alternative facilities will be based on several factors including actual ground water flow rates and contaminant profile obtained during pilot testing as well as the available processing capacity at each facility. What flow rate would make SWCWTF not feasible? What contaminants will be tested for and how often? What concentrations of which contaminants would make SWCWTF not feasible? With production shut down for three years, isn't there excess capacity in Bldg 374 treatment facility? Again this plan references Section 4.6 of the Subsurface IM/IRA Plan for specific criteria and Sec. 4.6 isn't that specific.

Page 5-3, Section 5.3 states that water will be pumped into a 10,000 gallon tank. Is the ground water storage tank double lined? Is there a berm around the tank? Where will the water flow if the tank fails? Is the water in the tank ever tested? For what and how often?

Page 6-17, Section 6.8.2 states that entrained water from the extracted vapor stream will be collected in the knockout drum/demister. The collected water will be pumped from the drum to the ground water holding tank. Is the drum piped directly into the tank? is the condensate ever tested? For what and how often?

Comments provided by Ken Korkia, Rocky Flats Cleanup Commission

General Comments:

1) Radionuclide Monitoring

The Cleanup Commission appreciates the continual monitoring that will be done at the exhaust stack for radionuclide contamination and the implementation of procedures to shut-down the system if high readings are recorded. Still, there should be some type of monitoring system installed before the GAC units to ensure that radionuclide contaminated air will not foul these units.

2) Radionuclide Contamination of the GAC Units

As mentioned in the previous comment, there is concern that the GAC units could become contaminated with radionuclides during their operation. If there is not going to be a monitoring system installed that will warn of radionuclide contamination of these units, what are the procedures for handling the spent carbon? There appears to be no standardized operating procedure listed in Table D-1 of Appendix D, or in the list comprising Appendix F, that addresses the testing and handling of potentially radionuclide contaminated spent carbon.

3) Use of the South Walnut Creek Treatment System

The Cleanup Commission is concerned over the choice of the South Walnut Creek Seep Treatment Unit as the preferred alternative to treat extracted groundwater. Has this decision been made prematurely given the limited operational history of the South Walnut Creek Unit? Given the Observational/Streamlined Approach framework, more information needs to be given concerning alternatives to the use of the South Walnut Creek system if chemical parameters, especially radionuclides, are different from what is anticipated. There are not many details in this Test Plan for how water will be sampled. Two discrete water units, that extracted from the ground, and that arising from the condensate in the knockout drum/demister need to be evaluated and details provided in the Test Report.